NON-PUBLIC?: N
ACCESSION #: 9008240175
LICENSEE EVENT REPORT (LER)

FACILITY NAME: South Texas, Unit 1 PAGE: 1 OF 4

DOCKET NUMBER: 05000498

TITLE: Reactor Trip Caused by Both Logic Trains of the Solid State Protection System Being In the Urgent Alarm Condition
EVENT DATE: 07/16/90 LER #: 90-020-00 REPORT DATE: 08/16/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Scott Head - Supervisory Licensing Engineer TELEPHONE: (512) 972-7136

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: JE COMPONENT: AS MANUFACTURER: G223
REPORTABLE NPRDS: Yes

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

At 0236, on July 16, 1990 with Unit 1 at 100% power, a reactor trip occurred during performance of a Solid State Protection System (SSPS) surveillance test. The trip was caused by a malfunction in a test switch which resulted in one train of SSPS remaining in the Urgent Alarm condition, coupled with completion of a subsequent procedural step that placed the other SSPS train in the Urgent Alarm condition. The SSPS is designed such that if both logic trains are placed in the Urgent Alarm condition, a reactor trip occurs. The test switch will be replaced prior to startup from the next refueling outage. In addition, test procedures have been revised to ensure that Urgent Alarm conditions are satisfactorily cleared prior to continuing with procedural steps that could result in a reactor trip.

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END OF ABSTRACT

DESCRIPTION OF EVENT:

At 0236, on July 16, 1990 with Unit 1 in Mode 1 at 100 percent power, a reactor trip occurred during the performance of a Solid State Protection System (SSPS) surveillance test. A turbine trip was initiated by the reactor trip and feedwater isolation occurred on low Reactor Coolant System (RCS) average temperature. Auxiliary feedwater (AFW) actuated on a low-low steam generator level signal. No other Engineered Safety Feature (ESF) actuations occurred during this event. The Main Steam Isolation Valves were manually closed to minimize the cooldown and the Steam Dump Valves and Steam Generator Power Operated Relief Valves operated as expected. Control room personnel responded in accordance with the Emergency Operating Procedures and stabilized the plant. The NRC was notified at 0500 hours.

The SSPS consists of logic trains R and S. Placing either logic train in a test configuration results in an Urgent Alarm. Placing both trains in test simultaneously, i.e., both trains in the Urgent Alarm condition, results in a reactor trip. Prior to the event, a Train S reactor trip breaker Trip Actuating Device Operational Test (TADOT) was being performed. The procedure requires placing Train S test switch A in the test position which results in an Urgent Alarm. Subsequent steps require placing the switch in the "off" position which clears the Urgent Alarm. Investigation confirmed that Test Switch A was placed in the "off" position as required. However, the contacts apparently did not make and the Urgent Alarm remained energized. In a subsequent procedure step, a Multiplexer Test Switch in the Train R cabinet is required to be moved from the "Normal" to the "R+S" position by passing through the "Inhibit" position. This manipulation momentarily enables the Train R Urgent Alarm. Since an Urgent Alarm condition still existed from Train S, a reactor trip was generated.

Subsequent to the trip, it was found that with additional manipulation of test switch A, the Train S Urgent Alarm could be deenergized. During a repeat performance of the surveillance test, the conditions that allowed the Train S Urgent Alarm to remain enabled could not be recreated.

Similar malfunctions have previously occurred with two identical SSPS test switches while performing logic tests, however, no plant transients occurred since the problems were identified by the operators. One test switch was replaced during the last Unit 1 refueling outage and sent to

the vendor for analysis. The vendor indicated that the switch showed signs of wear. The second switch, located in the Unit 2 SSPS, is scheduled to be replaced in the upcoming refueling outage.

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DESCRIPTION OF EVENT - Continued:

The test procedure did not include a verification step to ensure the Urgent Alarm is cleared prior to engaging the Train R test circuit. A verification step would have enabled test personnel to take remedial action prior to proceeding to the next step in the procedure.

CAUSE OF EVENT:

The reactor trip was caused when both the R and S logic trains of SSPS were in the Urgent Alarm condition at the same time. The situation was caused by a malfunction in a test switch which resulted in one train of SSPS remaining in the Urgent Alarm condition, coupled with completion of a subsequent procedural step that placed the other SSPS train in the Urgent Alarm condition. A contributing factor was that the test procedure did not require verification to ensure that Urgent Alarms would not be engaged for both logic trains simultaneously.

ANALYSIS OF EVENT:

Unplanned reactor protection system actuation is reportable pursuant to 10CFR50.73(a)(2)(iv). The reactor tripped as required and plant equipment operated as expected. The test switch malfunction was cleared and the SSPS was returned to service. At no time could this particular test switch create conditions wherein the SSPS could not fulfill its safety function. There were no adverse radiological or safety consequences as a result of this event.

CORRECTIVE ACTION:

The following corrective actions are being taken as a result of this event:

1) Procedures have been revised to ensure that the Urgent Alarm for one SSPS train is successfully cleared prior to initiating the Urgent Alarm condition for the other train. This will prevent any similar occurrences prior to switch replacement.

CORRECTIVE ACTION - Continued:

2) The test switch that previously malfunctioned on Unit 2 will be replaced during the upcoming refueling outage and will be sent offsite for analysis. Results of this analysis will be evaluated and appropriate actions implemented regarding generic implications of this switch failure.

3) The Unit 1 Train S logic test switch A will be replaced prior to startup from the next refueling outage.

ADDITIONAL INFORMATION:

The test switch is a 24 position rotary switch manufactured by Grayhill, model number 53M15-10-01-24N-C.

No similar events have been reported at the South Texas Project.

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The Light company South Texas Project Electric Generating Station
Houston Lighting & Power P. O. Box 289 Wadsworth, Texas 77483

August 16, 1990
ST-HL-AE-3539
File No.: G26
10CFR50.73

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Unit 1
Docket No. STN 50-498
Licensee Event Report 90-020 Regarding
A Reactor Trip Caused by Both Logic Trains
of Solid State Protection System
Being in the Urgent Alarm Condition

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P) submits the attached Licensee Event Report (LER 90-020) regarding a reactor trip caused by both logic trains of the Solid State Protection System being in the Urgent Alarm condition. This event had no adverse impact on the health and safety of the public.

If you should have any questions on this matter, please contact Mr. S. M. Head at (512) 972-7136 or myself at (512) 972-7921.

Warren H. Kinsey, Jr.
Vice President
Nuclear Generation

SMH/nl

Attachment: LER 90-020 (South Texas, Unit 1)

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A Subsidiary of Houston Industries Incorporated

cc:

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Revised 12/15/89

L4/NRC/

*** END OF DOCUMENT ***